

Idaho National Engineering and Environmental Laboratory

Developing a National Research Agenda in the Subsurface Sciences

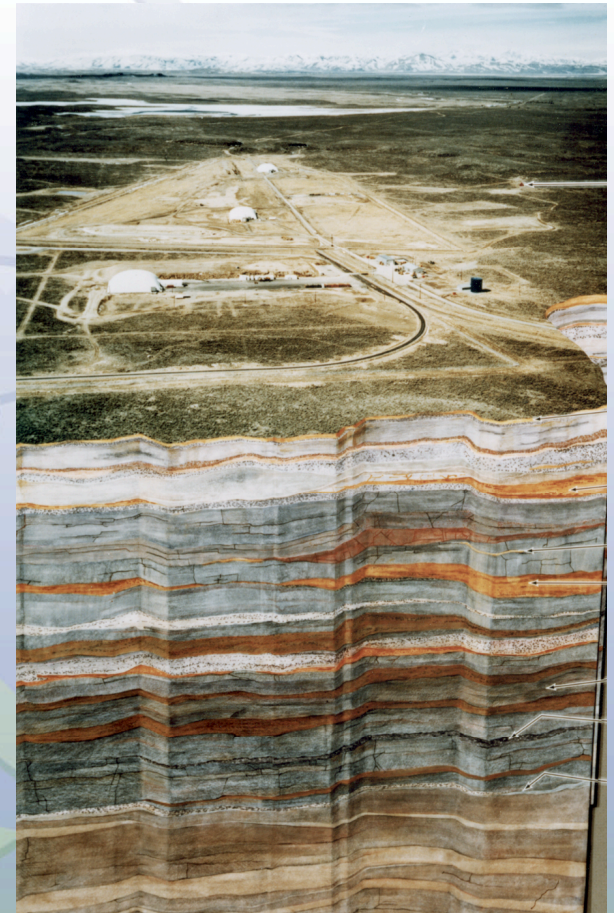
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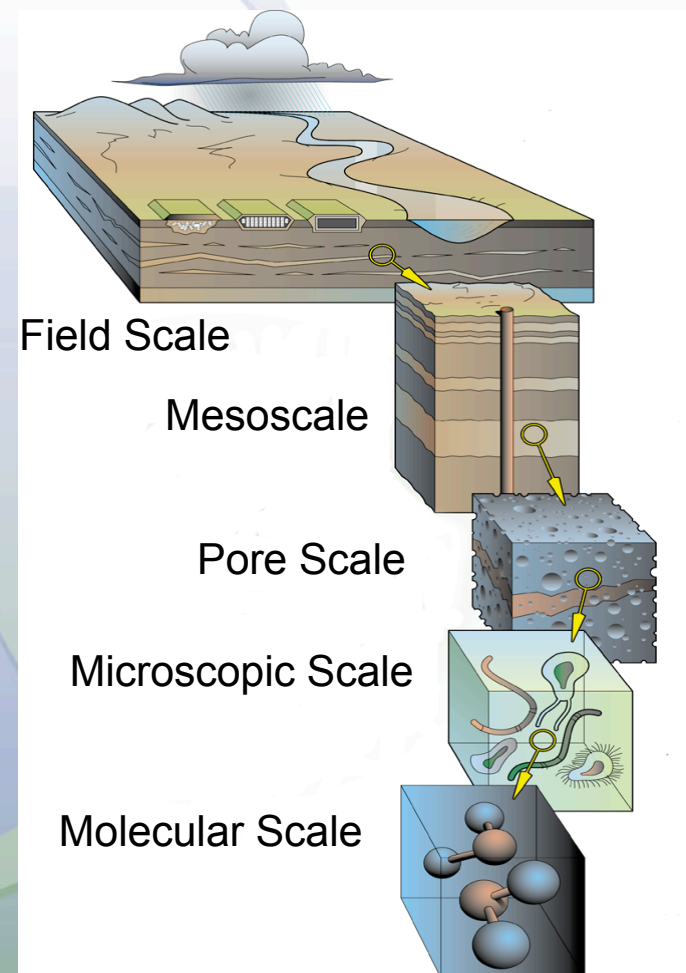
Subsurface Sciences are Key to Solving Society's Critical Problems

- *Long-term protection of the world's aquifers from contamination*
- *Safe, long-term containment of hazardous materials in the subsurface*
- *Protection of the ecosystem from deliberate chemical, radioactive, or biological contamination*
- *High, sustained level of agricultural productivity*
- *Identification, characterization, and use of energy and mineral resources*
- *Mitigation of global climate change through subsurface processes (carbon sequestration, global water cycle)*



Problems are *Broad in Scope*

- *Limited understanding of*
 - *subsurface properties, processes and parameters*
 - *coupling among processes*
- *Inadequate technology for characterizing subsurface properties and heterogeneities*
- *Lack of data sets for model calibration and validation*
- *Laboratory data may not scale up to field scale*



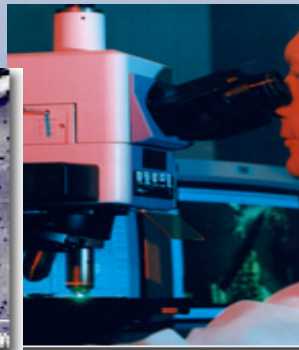
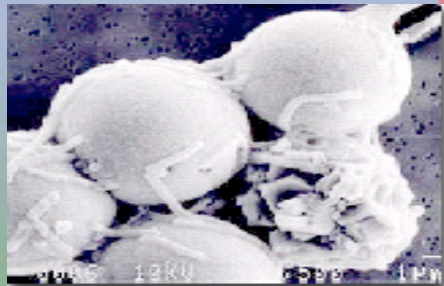
We are Poised to Make Breakthrough Advances in Subsurface Sciences

- Rapid progress now being made will lead to breakthroughs in the subsurface sciences*

***microbiology and ecology
mineral surface processes
instrumentation, sensors
numerical methods***

***geochemistry
fracture flow
imaging
computing***

- To meet societal needs, a coordinated and sustained research effort is needed to better understand and manipulate subsurface properties and processes*

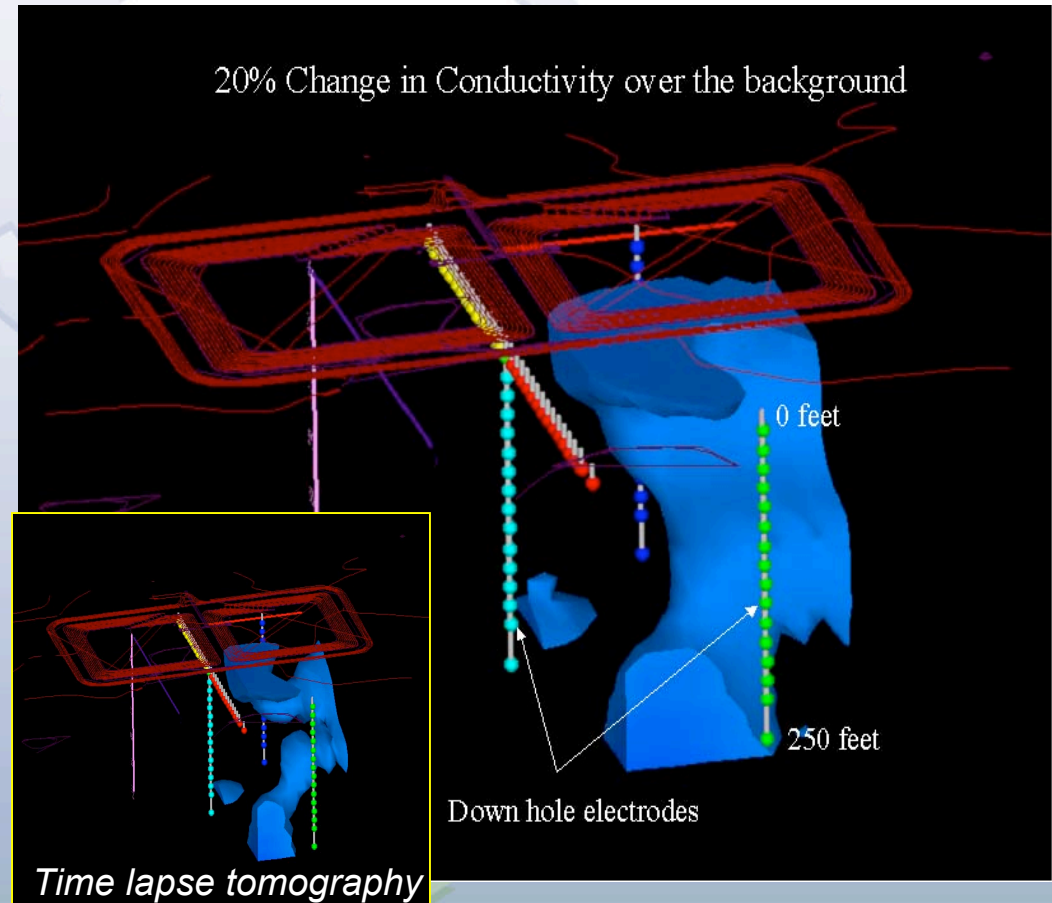


Developing a National Agenda

- Please join INEEL and LBNL in spearheading a National Strategic Initiative for addressing society's critical problems:

- CONSORTIUM FOR RESEARCH ON THE EARTH'S SUBSURFACE

CORES



CORES

- *Objective*
 - ***Develop a national research agenda in the subsurface sciences -- geology, hydrology, geochemistry, microbiology, geophysics, modeling -- to gain support for budget increases of more than \$100M per year***
- *Rationale*
 - *There is no national agenda for research in the subsurface sciences to address critical, long-term energy, national security, and environmental problems faced by the United States and other countries*

There is a developing mood in Congress to increase the DOE/SC budget -- NOW is the time to develop a National Research Agenda

CORES

*First draft research agenda
by end of 2004*

- *Implementation*
 - *Establish CORES charter and recruit membership*
 - *Establish steering committee*
 - *Host a series of focused science and engineering workshops on areas underlying intractable long-term energy, national security, and environmental problems*
- *Results*
 - *Sustained, coordinated subsurface science research programs in DOE, NSF and other agencies in which national labs, universities and the private sector can participate*

First CORES Workshop Held at LBNL 30, 31 July 03

- *Explore grand challenges in coupled processes -- what are the underlying barriers to being able to better address society's problems?*
- *Explore research approaches to these challenges*
- *Discuss questions posed by workshop presenters*
- *Produce a written report*
- *Use results as primary input to a larger workshop on the same topic next year*

Research in the Surface Sciences

- ***The need for a better understanding of the subsurface is widely recognized***
- ***We are poised to make significant advances in the subsurface sciences***
- ***The mood in Congress is to increase science budgets--goal over \$100M annually for subsurface research***
- ***CORES is seeking participation from other national laboratories, academic institutions, federal and state agencies, and the private sector***

